

SEQUENCE LISTING

<110> E.I. duPont de Nemours and Company Inc.
Meyer, Knut
Dhugga, Kanwarpal

<120> Method to Produce para-Hydroxybenzoic Acid in the Stem Tissue of
a Plant

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<223>	Chimeric gene. C4H promoter operably linked to HCHL coding sequence.						
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<211> 3570

<212> DNA

<213> artificial sequence

<220>

<223> Chimeric gene. 4CL1 promoter operably linked to HCHL coding sequence.

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 <220>
 <223> Chimeric gene. C3H promoter operably linked to HCHL coding sequence.

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<211> 1007

<212> PRT

<213> Zea mays

<400> 34

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20	30

Leu Asp Glu Asp Ala Ala Glu Gly Arg Thr Thr Cys Ala Arg Cys Gly	
35	40
35	45

Gly Asp Tyr Ala Ala Ile Asn Pro Ala Arg Ala Ser Glu Gly Thr Glu	
50	55
50	60

Ala Glu Glu Glu Val Val Glu Asn His His Thr Ala Gly Gly Leu Arg	
65	70
65	75
65	80

Glu Arg Val Thr Met Gly Ser His Leu Asn Asp Arg Gln Asp Glu Val	
85	90
85	95

Ser His Ala Arg Thr Met Ser Ser Leu Ser Gly Ile Gly Ser Glu Leu	
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100	110

Asn Asp Glu Ser Gly Lys Pro Ile Trp Lys Asn Arg Val Glu Ser Trp	
115	120
115	125

Lys Glu Lys Lys Asn Glu Lys Lys Ala Ser Ala Lys Lys Thr Ala Ala	
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130	140

Lys Ala Gln Pro Pro Pro Val Glu Glu Gln Ile Met Asp Glu Lys Asp	
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145	155
145	160

Leu Thr Asp Ala Tyr Glu Pro Leu Ser Arg Val Ile Pro Ile Ser Lys	
165	170
165	175

Asn Lys Leu Thr Pro Tyr Arg Ala Val Ile Ile Met Arg Leu Ile Val	
180	185
180	190

Leu Gly Leu Phe Phe His Tyr Arg Ile Thr Asn Pro Val Asn Ser Ala
195 200 205

Phe Gly Leu Trp Met Thr Ser Val Ile Cys Glu Ile Trp Phe Gly Phe
210 215 220

Ser Trp Ile Leu Asp Gln Phe Pro Lys Trp Tyr Pro Ile Asn Arg Glu
225 230 235 240

Thr Tyr Val Asp Arg Leu Ile Ala Arg Tyr Gly Asp Gly Glu Ser
245 250 255

Gly Leu Ala Pro Val Asp Phe Phe Val Ser Thr Val Asp Pro Leu Lys
260 265 270

Glu Pro Pro Leu Ile Thr Ala Asn Thr Val Leu Ser Ile Leu Ala Val
275 280 285

Asp Tyr Pro Val Glu Lys Ile Ser Cys Tyr Val Ser Asp Asp Gly Ser
290 295 300

Ala Met Leu Thr Phe Glu Ser Leu Ala Glu Thr Ala Glu Tyr Ala Arg
305 310 315 320

Lys Trp Val Pro Phe Cys Lys Tyr Ala Ile Glu Pro Arg Ala Pro
325 330 335

Glu Phe Tyr Phe Ser Gln Lys Ile Asp Tyr Leu Lys Asp Lys Ile His
340 345 350

Pro Ser Phe Val Lys Glu Arg Arg Ala Met Lys Arg Asp Tyr Glu Glu
355 360 365

Tyr Lys Val Arg Ile Asn Ala Leu Val Ala Lys Ala Gln Lys Thr Pro
370 375 380

Asp Glu Gly Trp Ile Met Gln Asp Gly Thr Pro Trp Pro Gly Asn Asn
385 390 395 400

Pro Arg Asp His Pro Gly Met Ile Gln Val Phe Leu Gly Glu Thr Gly
405 410 415

Ala Arg Asp Phe Asp Gly Asn Glu Leu Pro Arg Leu Val Tyr Val Ser
420 425 430

Arg Glu Lys Arg Pro Gly Tyr Gln His His Lys Lys Ala Gly Ala Met
435 440 445

Asn Ala Leu Val Arg Val Ser Ala Val Leu Thr Asn Ala Pro Tyr Ile
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Leu Asn Leu Asp Cys Asp His Tyr Val Asn Asn Ser Lys Ala Val Arg

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Tyr Val Gln Phe Pro Gln Arg Phe Asp Gly Ile Asp Arg Ser Asp Arg			
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Tyr Ala Asn Arg Asn Val Val Phe Phe Asp Val Asn Met Lys Gly Leu			
515	520	525	
Asp Gly Leu Gln Gly Pro Val Tyr Val Gly Thr Gly Cys Cys Phe Asn			
530	535	540	
Arg Gln Ala Leu Tyr Gly Tyr Gly Pro Pro Ser Leu Pro Ala Leu Pro			
545	550	555	560
Lys Ser Ser Ile Cys Ser Trp Cys Cys Cys Cys Pro Lys Lys Lys			
565	570	575	
Val Glu Arg Ser Glu Arg Glu Ile Asn Arg Asp Ser Arg Arg Glu Asp			
580	585	590	
Leu Glu Ser Ala Ile Phe Asn Leu Arg Glu Ile Asp Asn Tyr Asp Glu			
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Tyr Glu Arg Ser Met Leu Ile Ser Gln Met Ser Phe Glu Lys Ser Phe			
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Gly Leu Ser Ser Val Phe Ile Glu Ser Thr Leu Met Glu Asn Gly Gly			
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Val Pro Glu Ser Ala Asn Pro Ser Thr Leu Ile Lys Glu Ala Ile His			
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Val Ile Ser Cys Gly Tyr Glu Glu Lys Thr Glu Trp Gly Lys Glu Ile			
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Gly Trp Ile Tyr Gly Ser Val Thr Glu Asp Ile Leu Thr Gly Phe Lys			
675	680	685	
Met His Cys Arg Gly Trp Arg Ser Ile Tyr Cys Met Pro Val Arg Pro			
690	695	700	
Ala Phe Lys Gly Ser Ala Pro Ile Asn Leu Ser Asp Arg Leu His Gln			
705	710	715	720
Val Leu Arg Trp Ala Leu Val Ser Val Glu Ile Phe Phe Ser Arg His			
725	730	735	
Cys Pro Leu Trp Tyr Gly Tyr Gly Gly Arg Leu Lys Trp Leu Gln			
740	745	750	

Arg Leu Ser Tyr Ile Asn Thr Ile Val Tyr Pro Phe Thr Ser Leu Pro
 755 760 765
 Leu Val Ala Tyr Cys Cys Leu Pro Ala Ile Cys Leu Leu Thr Gly Lys
 770 775 780
 Phe Ile Ile Pro Thr Leu Ser Asn Ala Ala Thr Ile Trp Phe Leu Gly
 785 790 795 800
 Leu Phe Met Ser Ile Ile Val Thr Ser Val Leu Glu Leu Arg Trp Ser
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 Gly Ile Gly Ile Glu Asp Trp Trp Arg Asn Glu Gln Phe Trp Val Ile
 820 825 830
 Gly Gly Val Ser Ala His Leu Phe Ala Val Phe Gln Gly Ile Leu Lys
 835 840 845
 Met Ile Ala Gly Leu Asp Thr Asn Phe Thr Val Thr Ala Lys Ala Thr
 850 855 860
 Asp Asp Thr Glu Phe Gly Glu Leu Tyr Leu Phe Lys Trp Thr Thr Val
 865 870 875 880
 Leu Ile Pro Pro Thr Ser Ile Leu Val Leu Asn Leu Val Gly Val Val
 885 890 895
 Ala Gly Phe Ser Ala Ala Leu Asn Ser Gly Tyr Glu Ser Trp Gly Pro
 900 905 910
 Leu Phe Gly Lys Val Phe Phe Ala Met Trp Val Ile Met His Leu Tyr
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 Pro Phe Leu Lys Gly Leu Met Gly Arg Gln Asn Arg Thr Pro Thr Ile
 930 935 940
 Val Val Leu Trp Ser Val Leu Leu Ala Ser Val Phe Ser Leu Leu Trp
 945 950 955 960
 Val Lys Ile Asp Pro Phe Val Gly Gly Thr Glu Thr Val Asn Thr Asn
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 Asn Cys Asn Thr His Leu Leu Ile His His Arg Ser Ala Ala Val Val
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 <212> DNA

<213> Zea mays

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		ctcgacacaac	cggaacgagc	tggtgctgat	ccggggccac	gaggaccca	agccgctgcg	180
		ggcgtgagc	gggcagggtgt	gcgagatatg	cggcagcag	gtcggctca	cggtgacgg	240
		cgacctttc	gtcgctgca	acgagtgcgg	tttccccgtg	tgccggccct	gctacgagta	300
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aaaaaaaaaa aaaaaaaaaa aaa	3443

<210> 36
 <211> 1052
 <212> PRT
 <213> Zea mays

<400> 36

Met Glu Ala Ser Ala Gly Leu Val Ala Gly Ser His Asn Arg Asn Glu
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Leu Val Leu Ile Arg Gly His Glu Asp Pro Lys Pro Leu Arg Ala Leu
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Ser Gly Gln Val Cys Glu Ile Cys Gly Asp Glu Val Gly Leu Thr Val
 35 40 45

Asp Gly Asp Leu Phe Val Ala Cys Asn Glu Cys Gly Phe Pro Val Cys
 50 55 60

Arg Pro Cys Tyr Glu Tyr Glu Arg Arg Glu Gly Thr Gln Asn Cys Pro
 65 70 75 80

Gln Cys Lys Thr Arg Tyr Lys Arg Leu Lys Gly Ser Pro Arg Val Ala
 85 90 95

Gly Asp Asp Asp Glu Glu Asp Ile Asp Asp Leu Glu His Glu Phe Asn
 100 105 110

Ile Asp Asp Glu Asn Gln Gln Arg Gln Leu Glu Gly Asn Met Gln Asn
 115 120 125

Ser Gln Ile Thr Glu Ala Met Leu His Gly Arg Met Ser Tyr Gly Arg
 130 135 140

Gly Pro Asp Asp Gly Asp Gly Asn Asn Thr Pro Gln Ile Pro Pro Ile
 145 150 155 160

Ile Thr Gly Ser Arg Ser Val Pro Val Ser Gly Glu Phe Pro Ile Thr
 165 170 175

Asn Gly Tyr Gly His Gly Glu Val Ser Ser Ser Leu His Lys Arg Ile
 180 185 190

His Pro Tyr Pro Val Ser Glu Pro Gly Ser Ala Lys Trp Asp Glu Lys
 195 200 205

Lys Glu Val Ser Trp Lys Glu Arg Met Asp Asp Trp Lys Ser Lys Gln
 210 215 220

Gly Ile Leu Gly Gly Ala Asp Pro Glu Asp Met Asp Ala Asp Val
 225 230 235 240

Ala Leu Asn Asp Glu Ala Arg Gln Pro Leu Ser Arg Lys Val Ser Ile
 245 250 255

Ala Ser Ser Lys Val Asn Pro Tyr Arg Met Val Ile Val Val Arg Leu
 260 265 270

Val Val Leu Ala Phe Phe Leu Arg Tyr Arg Ile Leu His Pro Val Pro
 275 280 285

Asp Ala Ile Gly Leu Trp Leu Val Ser Ile Ile Cys Glu Ile Trp Phe
 290 295 300

Ala Ile Ser Trp Ile Leu Asp Gln Phe Pro Lys Trp Phe Pro Ile Asp
 305 310 315 320

Arg Glu Thr Tyr Leu Asp Arg Leu Ser Leu Arg Tyr Glu Arg Glu Gly
325 330 335

Glu Pro Ser Leu Leu Ser Ala Val Asp Leu Phe Val Ser Thr Val Asp
340 345 350

Pro Leu Lys Glu Pro Pro Leu Val Thr Ala Asn Thr Val Leu Ser Ile
355 360 365

Leu Ala Val Asp Tyr Pro Val Asp Lys Val Ser Cys Tyr Val Ser Asp
370 375 380

Asp Gly Ala Ser Met Leu Thr Phe Glu Ser Leu Ser Glu Thr Ala Glu
385 390 395 400

Phe Ala Arg Lys Trp Val Pro Phe Cys Lys Lys Phe Gly Ile Glu Pro
405 410 415

Arg Ala Pro Glu Phe Tyr Phe Ser Leu Lys Val Asp Tyr Leu Lys Asp
420 425 430

Lys Val Gln Pro Thr Phe Val Gln Glu Arg Arg Ala Met Lys Arg Glu
435 440 445

Tyr Glu Glu Phe Lys Val Arg Ile Asn Ala Leu Val Ala Lys Ala Met
450 455 460

Lys Val Pro Ala Glu Gly Trp Ile Met Lys Asp Gly Thr Pro Trp Pro
465 470 475 480

Gly Asn Asn Thr Arg Asp His Pro Gly Met Ile Gln Val Phe Leu Gly
485 490 495

His Ser Gly Gly His Asp Thr Glu Gly Asn Glu Leu Pro Arg Leu Val
500 505 510

Tyr Val Ser Arg Glu Lys Arg Pro Gly Phe Gln His His Lys Lys Ala
515 520 525

Gly Ala Met Asn Ala Leu Ile Arg Val Ser Ala Val Leu Thr Asn Ala
530 535 540

Pro Phe Met Leu Asn Leu Asp Cys Asp His Tyr Ile Asn Asn Ser Lys
545 550 555 560

Ala Ile Arg Glu Ala Met Cys Phe Leu Met Asp Pro Gln Val Gly Arg
565 570 575

Lys Val Cys Tyr Val Gln Phe Pro Gln Arg Phe Asp Gly Ile Asp Val
580 585 590

His Asp Arg Tyr Ala Asn Arg Asn Thr Val Phe Phe Asp Ile Asn Met

595	600	605
Lys Gly Leu Asp Gly Ile Gln Gly Pro Val Tyr Val	Gly Thr Gly Cys	
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Val Phe Arg Arg Gln Ala Leu Tyr Gly Tyr Asn Pro Pro	Lys Gly Pro	640
625 630 635		
Lys Arg Pro Lys Met Val Thr Cys Asp Cys Cys Pro Cys	Phe Gly Arg	655
645 650 655		
Lys Lys Arg Lys His Ala Lys Asp Gly Leu Pro Glu Gly	Thr Ala Asp	660 665 670
Met Gly Val Asp Ser Asp Lys Glu Met Leu Met Ser His	Met Asn Phe	675 680 685
Glu Lys Arg Phe Gly Gln Ser Ala Ala Phe Val Thr Ser	Thr Leu Met	690 695 700
Glu Glu Gly Val Pro Pro Ser Ser Pro Ala Ala Leu Leu	Lys	705 710 715 720
Glu Ala Ile His Val Ile Ser Cys Gly Tyr Glu Asp Lys	Thr Asp Trp	725 730 735
Gly Leu Glu Leu Gly Trp Ile Tyr Gly Ser Ile Thr Glu	Asp Ile Leu	740 745 750
Thr Gly Phe Lys Met His Cys Arg Gly Trp Arg Ser Val	Tyr Cys Met	755 760 765
Pro Lys Arg Ala Ala Phe Lys Gly Ser Ala Pro Ile Asn	Leu Ser Asp	770 775 780
Arg Leu Asn Gln Val Leu Arg Trp Ala Leu Gly Ser Val	Glu Ile Phe	785 790 795 800
Phe Ser Arg His Ser Pro Leu Leu Tyr Gly Tyr Lys Asn	Gly Asn Leu	805 810 815
Lys Trp Leu Glu Arg Phe Ala Tyr Ile Asn Thr Thr Ile	Tyr Pro Phe	820 825 830
Thr Ser Leu Pro Leu Leu Ala Tyr Cys Thr Leu Pro Ala	Val Cys Leu	835 840 845
Leu Thr Gly Lys Phe Ile Met Pro Ser Ile Ser Thr Phe	Ala Ser Leu	850 855 860
Phe Phe Ile Ala Leu Phe Met Ser Ile Phe Ala Thr Gly	Ile Leu Glu	865 870 875 880

Met Arg Trp Ser Gly Val Ser Ile Glu Glu Trp Trp Arg Asn Glu Gln
 885 890 895
 Phe Trp Val Ile Gly Gly Val Ser Ala His Leu Phe Ala Val Val Gln
 900 905 910
 Gly Leu Leu Lys Val Leu Ala Gly Ile Asp Thr Asn Phe Thr Val Thr
 915 920 925
 Ser Lys Ala Thr Gly Asp Glu Asp Asp Glu Phe Ala Glu Leu Tyr Ala
 930 935 940
 Phe Lys Trp Thr Thr Leu Leu Ile Pro Pro Thr Thr Leu Leu Ile Ile
 945 950 955 960
 Asn Val Ile Gly Val Val Ala Gly Ile Ser Asp Ala Ile Asn Asn Gly
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 Tyr Gln Ser Trp Gly Pro Leu Phe Gly Lys Leu Phe Phe Ala Phe Trp
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 Val Ile Val His Leu Tyr Pro Phe Leu Lys Gly Leu Met Gly Arg Gln
 995 1000 1005
 Asn Arg Thr Pro Thr Val Val Ile Trp Ser Ile Leu Leu Ala
 1010 1015 1020
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 <211> 3191
 <212> DNA
 <213> Oryza sativa

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<210> 38
 <211> 1063
 <212> PRT
 <213> Oryza sativa

<400> 38

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Thr Cys Arg Val Cys Gly Glu Glu Val Ala Ala Arg Glu Asp Gly Lys
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Pro Phe Val Ala Cys Ala Glu Cys Gly Phe Pro Val Cys Lys Pro Cys
 35 40 45

Tyr Glu Tyr Glu Arg Ser Glu Gly Thr Gln Cys Cys Pro Gln Cys Asn
 50 55 60

Thr Arg Tyr Lys Arg His Lys Gly Cys Pro Arg Val Glu Gly Asp Glu
 65 70 75 80

Asp Asp Gly Gly Asp Met Asp Asp Phe Glu Glu Glu Phe Gln Ile Lys
 85 90 95

Ser Pro Thr Lys Gln Lys Pro Pro His Glu Pro Val Asn Phe Asp Val
 100 105 110

Tyr Ser Glu Asn Gly Glu Gln Pro Ala Gln Lys Trp Arg Pro Gly Gly
 115 120 125

Pro Ala Leu Ser Ser Phe Thr Gly Ser Val Ala Gly Lys Asp Leu Glu
 130 135 140

Gln Glu Arg Glu Met Glu Gly Gly Met Glu Trp Lys Asp Arg Ile Asp
 145 150 155 160

Lys Trp Lys Thr Lys Gln Glu Lys Arg Gly Lys Leu Asn Arg Asp Asp 175
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Ser Asp Asp Asp Asp Asp Lys Asn Asp Asp Glu Tyr Met Leu Leu Ala 190
 180

Glu Ala Arg Gln Pro Leu Trp Arg Lys Val Pro Ile Pro Ser Ser Lys 205
 195

Ile Asn Pro Tyr Arg Ile Val Ile Val Leu Arg Leu Val Val Leu Cys 220
 210

Phe Phe Leu Lys Phe Arg Ile Thr Thr Pro Ala Met Asp Ala Val Pro 240
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Leu Trp Leu Ala Ser Val Ile Cys Glu Leu Trp Phe Ala Leu Ser Trp 255
 245

Ile Leu Asp Gln Leu Pro Lys Trp Ser Pro Val Thr Arg Glu Thr Tyr 270
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Leu Asp Arg Leu Ala Leu Arg Tyr Glu Arg Asp Gly Glu Pro Cys Arg 285
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Leu Ala Pro Ile Asp Phe Phe Val Ser Thr Val Asp Pro Leu Lys Glu 300
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Pro Pro Ile Ile Thr Ala Asn Thr Val Leu Ser Ile Leu Ala Val Asp 320
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Tyr Pro Val Asp Arg Val Ser Cys Tyr Val Ser Asp Asp Gly Ala Ser 335
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Met Leu Leu Phe Asp Thr Leu Ser Glu Thr Ala Glu Phe Ala Arg Arg 350
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Trp Val Pro Phe Cys Lys Lys Phe Thr Ile Glu Pro Arg Ala Pro Glu 365
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Phe Tyr Phe Ser Gln Lys Ile Asp Tyr Leu Lys Asp Lys Val Gln Pro 380
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Thr Phe Val Lys Glu Arg Arg Ala Met Lys Arg Glu Tyr Glu Glu Phe 400
 385

Lys Val Arg Ile Asn Ala Leu Val Ala Lys Ala Gln Lys Lys Pro Glu 415
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Glu Gly Trp Val Met Gln Asp Gly Thr Pro Trp Pro Gly Asn Asn Thr 430
 420

Arg Asp His Pro Gly Met Ile Gln Val Tyr Leu Gly Ser Gln Gly Ala
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Leu Asp Val Glu Gly Ser Glu Leu Pro Arg Leu Val Tyr Val Ser Arg
450 455 460
Glu Lys Arg Pro Gly Tyr Asn His His Lys Lys Ala Gly Ala Met Asn
465 470 475 480
Ser Leu Val Arg Val Ser Ala Val Leu Thr Asn Ala Pro Phe Ile Leu
485 490 495
Asn Leu Asp Cys Asp His Tyr Val Asn Asn Ser Lys Ala Val Arg Glu
500 505 510
Ala Met Cys Phe Leu Met Asp Lys Gln Leu Gly Lys Lys Leu Cys Tyr
515 520 525
Val Gln Phe Pro Gln Arg Phe Asp Gly Ile Asp Arg His Asp Arg Tyr
530 535 540
Ala Asn Arg Asn Thr Val Phe Phe Asp Ile Asn Met Lys Gly Leu Asp
545 550 555 560
Gly Ile Gln Gly Pro Val Tyr Val Gly Thr Gly Thr Val Phe Asn Arg
565 570 575
Gln Ala Leu Tyr Gly Tyr Asp Pro Pro Arg Pro Glu Lys Arg Pro Lys
580 585 590
Met Thr Cys Asp Cys Trp Pro Ser Trp Cys Cys Cys Cys Cys Cys Phe
595 600 605
Gly Gly Gly Lys Arg Gly Lys Ser His Lys Asn Lys Lys Gly Gly Gly
610 615 620
Gly Gly Glu Gly Gly Leu Asp Glu Pro Arg Arg Gly Leu Leu Gly
625 630 635 640
Phe Tyr Lys Lys Arg Ser Lys Lys Asp Lys Leu Gly Gly Gly Ala Ala
645 650 655
Ser Leu Ala Gly Gly Lys Lys Gly Tyr Arg Lys His Gln Arg Gly Phe
660 665 670
Glu Leu Glu Glu Ile Glu Glu Gly Leu Glu Gly Tyr Asp Glu Leu Glu
675 680 685
Arg Ser Ser Leu Met Ser Gln Lys Ser Phe Glu Lys Arg Phe Gly Gln
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Ser Pro Val Phe Ile Ala Ser Thr Leu Val Glu Asp Gly Gly Leu Pro

705	710	715	720
Gln Gly Ala Ala Ala Asp Pro Ala Ala Leu Ile Lys Glu Ala Ile His 725 730 735			
val Ile Ser Cys Gly Tyr Glu Glu Lys Thr Glu Trp Gly Lys Glu Ile 740 745 750			
Gly Trp Ile Tyr Gly Ser Val Thr Glu Asp Ile Leu Thr Gly Phe Lys 755 760 765			
Met His Cys Arg Gly Trp Lys Ser Val Tyr Cys Thr Pro Ala Arg Ala 770 775 780			
Ala Phe Lys Gly Ser Ala Pro Ile Asn Leu Ser Asp Arg Leu His Gln 785 790 795 800			
val Leu Arg Trp Ala Leu Gly Ser Val Glu Ile Phe Met Ser Arg His 805 810 815			
Cys Pro Leu Trp Tyr Ala Tyr Gly Gly Arg Leu Lys Trp Leu Glu Arg 820 825 830			
Phe Ala Tyr Thr Asn Thr Ile Val Tyr Pro Phe Thr Ser Ile Pro Leu 835 840 845			
Leu Ala Tyr Cys Thr Ile Pro Ala Val Cys Leu Leu Thr Gly Lys Phe 850 855 860			
Ile Ile Pro Thr Leu Asn Asn Leu Ala Ser Ile Trp Phe Ile Ala Leu 865 870 875 880			
Phe Leu Ser Ile Ile Ala Thr Gly Val Leu Glu Leu Arg Trp Ser Gly 885 890 895			
val Ser Ile Glu Asp Trp Trp Arg Asn Glu Gln Phe Trp Val Ile Gly 900 905 910			
Gly Val Ser Ala His Leu Phe Ala Val Phe Gln Gly Leu Leu Lys Val 915 920 925			
Leu Gly Gly Val Asp Thr Asn Phe Thr Val Thr Ser Lys Ala Ala Ala 930 935 940			
Asp Glu Thr Asp Ala Phe Gly Glu Leu Tyr Leu Phe Lys Trp Thr Thr 945 950 955 960			
Leu Leu Val Pro Pro Thr Thr Leu Ile Ile Ile Asn Met Val Gly Ile 965 970 975			
val Ala Gly Val Ser Asp Ala Val Asn Asn Gly Tyr Gly Ser Trp Gly 980 985 990			

Pro Leu Phe Gly Lys Leu Phe Phe Ser Phe Trp Val Ile Leu His Leu
995 1000 1005

Tyr Pro Phe Leu Lys Gly Leu Met Gly Arg Gln Asn Arg Thr Pro
1010 1015 1020

Thr Ile Val Val Leu Trp Ser Ile Leu Leu Ala Ser Ile Phe Ser
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Pro Val Leu Lys Pro Cys Gly Val Ser Cys
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<211> 2820
<212> DNA
<213> Oryza savita

<400> 39	60
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gtcgtggagg aggaagtgg aagagccac gagccggcgg ccggcggtgt tcgcgagagg	300
gtcaccatgg ccagccact cagcgatcac caggatgaag gagttcatgc caggactatg	360
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<211> 939

<212> PRT

<213> Oryza sativa

<400> 40

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Ala Ala Cys Arg Ala Cys Ser Tyr Ala Leu Cys Lys Ala Cys Leu Asp
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Glu Asp Ala Ala Glu Gly Arg Thr Thr Cys Ala Arg Cys Gly Gly Glu
35 40 45

Tyr Gly Ala Pro Asp Pro Ala His Gly Gln Gly Ala Val Val Glu Glu
50 55 60

Glu Val Glu Glu Ser His Glu Pro Ala Ala Gly Gly Val Arg Glu Arg
65 70 75 80

Val Thr Met Ala Ser Gln Leu Ser Asp His Gln Asp Glu Gly Val His
85 90 95

Ala Arg Thr Met Ser Thr His Ala Arg Thr Ile Ser Ser Val Ser Gly
100 105 110

Val Gly Ser Glu Leu Asn Asp Glu Ser Gly Lys Pro Ile Trp Lys Asn
115 120 125

Arg Val Glu Ser Trp Lys Glu Lys Lys Glu Lys Lys Ala Ser Ala
130 135 140

Lys Lys Ala Ala Ala Lys Ala Gln Ala Pro Pro Val Glu Glu Gln Ile
145 150 155 160

Met Asp Glu Lys Asp Leu Thr Asp Ala Tyr Glu Pro Leu Ser Arg Ile
165 170 175

Ile Pro Ile Ser Lys Asn Lys Leu Thr Pro Tyr Arg Ala Val Ile Ile
180 185 190

Met Arg Leu Val Val Leu Gly Leu Phe Phe His Tyr Arg Ile Thr Asn
195 200 205

Pro Val Tyr Ser Ala Phe Gly Leu Trp Met Thr Ser Val Ile Cys Glu
210 215 220

Ile Trp Phe Gly Phe Ser Trp Ile Leu Asp Gln Phe Pro Lys Trp Cys
225 230 235 240

Pro Ile Asn Arg Glu Thr Tyr Val Asp Arg Leu Ile Ala Arg Tyr Gly
245 250 255

Asp Gly Glu Asp Ser Gly Leu Ala Pro Val Asp Phe Phe Val Ser Thr
260 265 270

Val Asp Pro Leu Lys Glu Pro Pro Leu Ile Thr Ala Asn Thr Val Leu
275 280 285

Ser Ile Leu Ala Val Asp Tyr Pro Val Glu Lys Ile Ser Cys Tyr Val
290 295 300

Ser Asp Asp Gly Ser Ala Met Leu Thr Phe Glu Ser Leu Ala Glu Thr

305	310	315	320
Ala Glu Phe Ala Arg Arg Trp Val Pro Phe Cys Lys Lys Tyr Ser Ile			
325	330	335	
Glu Pro Arg Ala Pro Glu Phe Tyr Phe Ser Gln Lys Ile Asp Tyr Leu			
340	345	350	
Lys Asp Lys Ile His Pro Ser Phe Val Lys Glu Arg Arg Ala Met Lys			
355	360	365	
Arg Asp Tyr Glu Glu Tyr Lys Val Arg Ile Asn Ala Leu Val Ala Lys			
370	375	380	
Ala Gln Lys Thr Pro Glu Glu Gly Trp Ile Met Gln Asp Gly Thr Pro			
385	390	395	400
Trp Pro Gly Asn Asn Pro Arg Asp His Pro Gly Met Ile Gln Val Phe			
405	410	415	
Leu Gly Glu Thr Gly Ala Arg Asp Phe Asp Gly Asn Glu Leu Pro Arg			
420	425	430	
Leu Val Tyr Val Ser Arg Glu Lys Arg Pro Gly Tyr Gln His His Lys			
435	440	445	
Lys Ala Gly Ala Met Asn Ala Leu Val Arg Val Ser Ala Val Leu Thr			
450	455	460	
Asn Ala Pro Tyr Ile Leu Asn Leu Asp Cys Asp His Tyr Val Asn Asn			
465	470	475	480
Ser Lys Ala Val Arg Glu Ala Met Cys Phe Met Met Asp Pro Ser Val			
485	490	495	
Gly Arg Asp Val Cys Tyr Val Gln Phe Pro Gln Arg Phe Asp Gly Ile			
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Asp Arg Ser Asp Arg Tyr Ala Asn Arg Asn Val Val Phe Phe Asp Val			
515	520	525	
Asn Met Lys Gly Leu Asp Gly Leu Gln Gly Pro Val Tyr Val Gly Thr			
530	535	540	
Gly Cys Cys Phe Tyr Arg Gln Ala Leu Tyr Gly Tyr Gly Pro Pro Ser			
545	550	555	560
Leu Pro Ala Leu Pro Lys Ser Ser Val Cys Ser Trp Cys Cys Cys			
565	570	575	
Cys Pro Lys Lys Lys Ala Glu Lys Ser Glu Lys Glu Met His Arg Asp			
580	585	590	

Ser Arg Arg Glu Asp Leu Glu Ser Ala Ile Phe Asn Leu Arg Glu Ile
 595 600 605
 Asp Asn Tyr Asp Glu Tyr Glu Arg Ser Met Leu Ile Ser Gln Met Ser
 610 615 620
 Phe Glu Lys Ser Phe Gly Leu Ser Ser Val Phe Ile Glu Ser Thr Leu
 625 630 635 640
 Met Glu Asn Gly Gly Val Pro Glu Ser Ala Asn Pro Ser Thr Leu Ile
 645 650 655
 Lys Glu Ala Ile His Val Ile Ser Cys Gly Tyr Glu Glu Lys Thr Glu
 660 665 670
 Trp Gly Lys Glu Val Leu Arg Trp Ala Leu Gly Ser Val Glu Ile Phe
 675 680 685
 Leu Ser Arg His Cys Pro Leu Trp Tyr Gly Tyr Gly Gly Arg Leu
 690 695 700
 Lys Trp Leu Gln Arg Leu Ser Tyr Ile Asn Thr Ile Val Tyr Pro Phe
 705 710 715 720
 Thr Ser Leu Pro Leu Ile Ala Tyr Cys Cys Leu Pro Ala Ile Cys Leu
 725 730 735
 Leu Thr Gly Lys Phe Ile Ile Pro Thr Leu Ser Asn Ala Ala Thr Ile
 740 745 750
 Trp Phe Leu Gly Leu Phe Ile Ser Ile Ile Val Thr Ser Val Leu Glu
 755 760 765
 Leu Arg Trp Ser Gly Ile Gly Ile Glu Asp Trp Trp Arg Asn Glu Gln
 770 775 780 785
 Phe Trp Val Ile Gly Gly Val Ser Ala His Leu Phe Ala Val Phe Gln
 790 795 800
 Gly Ile Leu Lys Met Ile Ala Gly Leu Asp Thr Asn Phe Thr Val Thr
 805 810 815
 Ala Lys Ala Thr Asp Asp Thr Glu Phe Gly Glu Leu Tyr Val Phe Lys
 820 825 830
 Trp Thr Thr Val Leu Ile Pro Pro Thr Ser Ile Leu Val Leu Asn Leu
 835 840 845
 Val Gly Val Val Ala Gly Phe Ser Asp Ala Leu Asn Ser Gly Tyr Glu
 850 855 860

Ser Trp Gly Pro Leu Phe Gly Lys Val Phe Phe Ala Met Trp Val Ile
865 870 875 880

Met His Leu Tyr Pro Phe Leu Lys Gly Leu Met Gly Arg Gln Asn Arg
885 890 895

Thr Pro Thr Ile Val Val Leu Trp Ser Val Leu Leu Ala Ser Val Phe
900 905 910

Ser Leu Leu Trp Val Lys Ile Asp Pro Phe Ile Gly Ser Ser Glu Thr
915 920 925

Thr Thr Thr Asn Ser Cys Ala Asn Phe Asp Cys
930 935

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<211> 3168
<212> DNA
<213> Oryza savita

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<213> Oryza savita

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Gln Cys Lys Thr Arg Tyr Lys Arg Leu Lys Gly Ser Pro Arg Val Pro
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Gln Asn Ser His Ile Thr Glu Ala Met Leu His Gly Lys Met Ser Tyr
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